



Version
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R&S® HZ-14 Probe Set for E and H near-field measurements

Detecting EMC trouble spots

- ◆ 9 kHz to 1 GHz
- ◆ Two H-field probes
- ◆ E-field probe with built-in preamplifier
- ◆ Preamplifier for H-field probes
- ◆ Test jig for H-field probes
- ◆ Locating radiated-emission sources
- ◆ Determining spots sensitive to EMI
- ◆ Assessing interference field strengths in the far field
- ◆ Measuring shielding and filter effectiveness
- ◆ Identifying defective components
- ◆ Evaluating near-field impedance



The near-field probe set comes in a handy transit case accommodating all parts of the set and providing effective protection during transportation

Uses

The R&S®HZ-14 probe set for E and H near-field measurements is a tool for detecting EMC trouble spots. It allows the identification and elimination of EMI sources as well as the detection of spots sensitive to electromagnetic interference at an early stage of product development, thus reducing the time to market. The R&S®HZ-14 is mainly used for diagnosing radiated emissions from printed boards, ICs, cables, leakage spots in shielded enclosures, and similar sources of electromagnetic interference. Since the H-field probes are passive when operated without a preamplifier, they can also be used to find EMI-sensitive components, and modules forming part of instruments or printed boards. The effectiveness of RFI suppression measures or the shielding provided by various types of enclosures and designs can be easily tested with the R&S®HZ-14 probe set.

Characteristics

The probe set covers the frequency range from 9 kHz to 1 GHz. It includes the following components:

- ◆ Two passive H-field probes (electrically shielded loops of small dimensions)
- ◆ One active E-field probe and one 30 dB preamplifier for the H-field probes
- ◆ One test jig for H-field probes

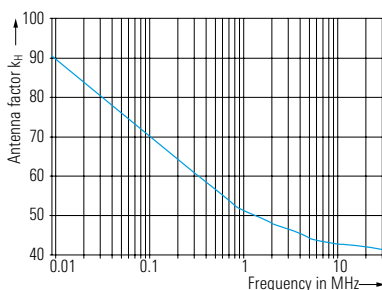
The ergonomic design of the probes ensures easy handling. Radiated emission sources can be easily located owing to the small size of the probe tips. The E-field probe is operated on DC power. The E-field probe and the preamplifier can be powered from all Rohde & Schwarz measuring receivers and spectrum analyzers.

The two H-field probes cover frequency ranges from 9 kHz to 30 MHz and 30 MHz to 1 GHz. They have the directivity of loop antennas, and are electrically shielded so that capacitive coupling is suppressed and electrical fields are rejected. Each probe comes with correction factors to determine the magnetic field strength for an input impedance of 50 Ω of the measuring receiver, thus ensuring a high reproducibility of measurements.

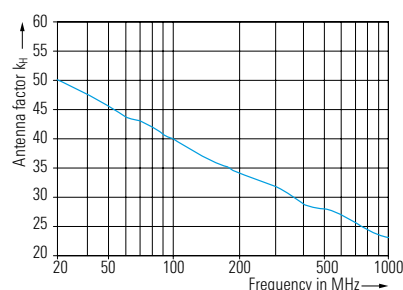
The two H-field probes are passive and can thus be operated bidirectionally so that local EMI immunity tests can be performed. It is therefore possible to induce currents into lines and test signals into components by applying a known signal source to the probe input.

A test jig supplied as standard allows the functional testing of the H-field probes and a simplified normalization of H-field measurements with the aid of tracking generators in spectrum analyzers. The test jig includes a terminated stripline shaped to take up H-field probes.

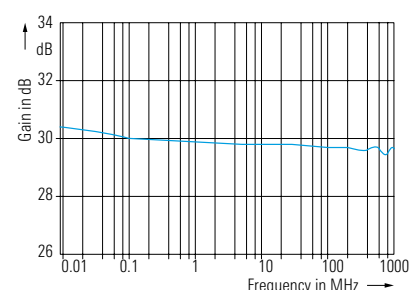
The active E-field probe is designed for omnidirectional signal reception over the entire frequency range. When approaching a radiation source, the probe is capacitively coupled. The E-field probe is powered from the DC supply of the measuring receiver/spectrum analyzer.



H-field probe 9 kHz to 30 MHz: antenna factor in dB [(μA/m)/μV] versus frequency



H-field probe 30 MHz to 1000 MHz: antenna factor in dB [(μA/m)/μV] versus frequency



Frequency response of amplifier

The 30 dB broadband preamplifier improves the S/N ratio in low-level measurements using H-field probes. Providing a gain of 30 dB in the frequency range from 9 kHz to 1 GHz, it has a noise figure of typ. <4 dB and a 1 dB compression point of 0 dBm (output level). High signal levels that might overload the probe and cause measurement errors are signaled by acoustic alarms. This applies both to CW and pulsed signals.



Complete R&S® HZ-14 probe set for E and H near-field measurements

Specifications

H-field probe (9 kHz to 30 MHz)	
Frequency range	9 kHz to 30 MHz
Usable frequency range	9 kHz to 100 MHz
Maximum permissible voltage of uninsulated conductor (0 Hz to 120 Hz)	500 V (V_p)
Connector	SMA female
Maximum input power (EMS testing)	0.5 W
Dimensions (W × H × D) (including RF connector)	256 mm × 38 mm × 18 mm (10.1 in × 1.5 in × 0.7 in)
H-field probe (30 MHz to 1 GHz)	
Frequency range	30 MHz to 1 GHz
Usable frequency range	1 MHz to 2 GHz
Maximum permissible voltage of uninsulated conductor (0 Hz to 120 Hz)	500 V (V_p)
VSWR	<2
Connector	SMA female
Maximum input power (EMS testing)	0.25 W
Dimensions (W × H × D) (including RF connector)	256 mm × 38 mm × 18 mm (10.1 in × 1.5 in × 0.7 in)
E-field probe (9 kHz to 1 GHz)	
Frequency range	9 kHz to 1 GHz
Unevenness of frequency response	±3 dB
Correction factor for voltage measurements	13 mV/V (=38 dB)
Antenna factor	67 dB (1/m)
Maximum sensing voltage	20 V
Connector	SMA female
Dimensions (W × H × D)	267 mm × 38 mm × 18 mm (10.5 in × 1.5 in × 0.7 in)
Operating temperature range	0 °C to +45 °C
DC supply	
Required DC voltage (with E-field probe)	10 V ±0.1 V
DC connector	LEMO (2 contacts with screen)
RF input	BNC female
RF output	N male
Dimensions (W × H × D)	103 mm × 26 mm × 27 mm (4.1 in × 1.0 in × 1.1 in)
Operating temperature range	0 °C to +45 °C

30 dB preamplifier	
Frequency range	9 kHz to 1 GHz
Gain	30 dB ±2 dB, typ. 30 dB ±1 dB
RF input	
Connector, impedance, VSWR	BNC female, 50 Ω, <2
RF output	
Connector, impedance, VSWR	N male, 50 Ω, <2
Noise figure	typ. <4 dB
Reverse attenuation (decoupling)	typ. 50 dB
Maximum output level (1 dB compression)	typ. 0 dBm
Maximum input level (damage limit)	15 dBm
Maximum DC voltage at RF input	16 V
Overload alarm	acoustic, with 1 dB compression
DC connector	LEMO (2 contacts with screen)
Required DC voltage	10 V ±0.1 V
Current drain	<100 mA
Overall dimensions (W × H × D)	103 mm × 26 mm × 27 mm (4.1 in × 1.0 in × 1.1 in)
Weight	0.14 kg (0.31 lb)
Operating temperature range	0 °C to +45 °C
Test jig	
Connector	N male
Impedance	50 Ω
Maximum input level	20 dBm
General data	
Dimensions of transit case (W × H × D)	380 mm × 300 mm × 80 mm (15.0 in × 11.8 in × 3.1 in)
Weight (with probe set)	1.7 kg (3.7 lb)

Ordering information

Designation	Type	Order No.
Probe set for E- and H-near field measurements (9 kHz to 1 GHz)	R&S®HZ-14	1026.7744.02
Supplied accessories	Connecting cable to power supply, length: 260 mm; connectors: LEMO/Tuchel, LEMO/probe connector R&S®FSP; RF connecting cable 50 Ω, length: 1.5 m, connectors: SMA/BNC	



More information at
www.rohde-schwarz.com
(search term: HZ-14)



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